REMARKS

This application has been reviewed in light of the Office Action dated December 19, 2005. Claims 1-13 and 32-38 are pending in the application. Claims 14-31 have been cancelled without prejudice pursuant to the restriction requirement. Applicant reserves that right to pursue these claims by a separated divisional application. By the present amendment, claims 1, 32, 33, 35 and 38 have been amended. No new matter has been added. The Examiner's reconsideration of the rejection in view of the amendment and the following remarks is respectfully requested.

By the Office Action, claims 33 and 35 were objected to due to informalities. Claims 33 and 35 have been amended in a way believed to overcome the objection.

By the Office Action, claim 38 stands rejected under 35 U.S.C. §112, second paragraph as being indefinite. Claim 38 has been amended in a way believed to overcome the rejection. Reconsideration is respectfully requested.

It is also noted that the dependencies from cancelled claims have been updated in claims 31-38.

By the Office Action, claims 1-13, and 32-38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the article: "A Derivative Free Optimization Algorithm in Practice" by Conn et al. (hereinafter Conn).

The Applicant respectfully disagrees with the rejection.

Conn sets up a mathematical solution for optimizing a nonlinear function without using derivatives (i.e., the mathematical operation of differentiation). The solution proposed is an algorithm that solves an unconstrained problem and is adapted to solve a constrained problem.

The constrained problem includes parameters that have requirements to be maintained within a range. The problem stated generally by Conn may be employed to provide an optimization of an objective function. This aspect of Conn is useful in the present application. However, the present claims are directed to a method that can employ the technique of Conn as a part of a new useful and unobvious way to design an electrical circuit. The present claims include steps and features not disclosed or suggested by Conn.

Claim 1 or the present invention recites, *inter alia,* a method for optimizing an electrical circuit including providing an objective to be minimized, and one or more independently tunable parameters to a derivative-free optimizer, the objective being defined as an objective measurement of the behavior of a circuit; receiving a value of each of the one or more independently tunable parameters from the derivative-free optimizer; providing each of the one or more independently tunable parameter values to a circuit simulator; receiving from the simulator the value of the objective measurement; providing the objective value to the derivative free optimizer; and repeating ...until the derivative free optimizer determines that the objective has converged to a minimum within a convergence tolerance.

Conn is directed to the optimization of a function, not the design of a circuit. As such, Conn fails to disclose or suggest at least : 1) a method for optimizing an electrical circuit; 2) providing an objective to be minimized ..., the objective being defined as an objective measurement of the behavior of a circuit; 3) providing one or more independently tunable parameter values to a circuit simulator; 4) receiving from the simulator the value of the objective measurement; 5) providing the objective value to the derivative free optimizer; and 6) repeating

...until the derivative free optimizer determines that the objective has converged to a minimum within a convergence tolerance.

Conn is directed to minimizing an objective function. The example given in Coon is that of a function for designing a helicopter blade. A function is defined in Conn for this purpose that accounts for all of the factors effecting blade rotor vibration. These may include the mass of the blade, the dimensions, the curvature etc. These factors may include relationships to one another. By setting forth these relationships in an objective function, the objective function can be minimized for the helicopter blade. While the framework set forth by Conn provides for the optimization of a function, there is no teaching or suggestion that the optimization results be simulated in an iterative fashion to not only optimize the function but also optimize one or more independently tunable parameters.

It should be understood that in accordance with claim 1, derivative-free optimization is performed to minimize an objective, a simulation is performed to output the one or more independently tunable parameters and then the simulation results are provided again to the optimizer. See e.g., FIG. 2 of the present disclosure. This is in no way disclosed or suggested by Conn.

By combining an optimizer that employs an algorithm, e.g., the algorithm of Conn, a circuit objective function is minimized, the circuit is then simulated and the results of the simulation are optimized by the optimizer (see e.g., FIG. 2). Conn does not suggest or contemplate the method as set forth in claim 1.

The Examiner stated that Conn describes a simulation and therefore Conn teaches a simulator. Upon careful consideration of Conn on page 1, column two, Conn states: "The

applications of this framework are frequently encountered in engineering. Typically, such problems arise when one needs to minimize an objective measured by some experiment or by a complicated simulation package, which is treated as a black box." This is wholly consistent with the Applicant position that Conn teaches the minimization of the objective, but not the optimization of simulated results after the objective had been optimized in a different step. Further, the disclosure of Conn does not teach or suggest at least: providing one or more independently tunable parameter values to a circuit simulator; receiving from the simulator the value of the objective measurement; providing the objective value to the derivative free optimizer; and repeating ...until the derivative free optimizer determines that the objective has converged to a minimum within a convergence tolerance. Such a general statement of Conn that an equation may be employed in an engineering model or that an equation is used to describe a physical phenomenon cannot be relied on to suggest the specific language of claim 1.

Even if, *arguendo*, the simulations referred to by Conn were of a circuit, nowhere in Conn is it disclosed or suggested to minimize an objective, simulate a circuit and then provide the simulation results to the optimizer again. The Applicants reading of the passage in Conn (page 1 column 2) is consistent with the proposition that the experiment or black box simulation is to merely optimize only an objective function in view of a plurality of parameters.

As such, it is respectfully submitted that Conn fails to disclose or suggest the all of the elements of claim 1. As such claim 1 and its dependent claims are believed to be in condition for allowance for at least the stated reasons. In addition, claim 6 and its dependent claims are also believed to be in condition for allowance for essentially the same reasons as set forth

regarding claim 1. Claim 6 includes additional features not disclosed or suggested by Conn as well. Reconsideration of the rejection is earnestly solicited.

By the Office Action, claims 1-13, and 32-38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the article: "A Derivative-Free Algorithm for a Class of Infinitely Constrained Problems" by Trahan et al. (hereinafter Trahan).

Trahan is even further away from the teachings of the present invention. Trahan like Conn is directed to minimizing a function (see equations 1a and 1b) using a derivative free algorithm. Trahan, like Conn, fails to teach or suggest, at least: providing one or more independently tunable parameter values to a circuit simulator; receiving from the simulator the value of the objective measurement; providing the objective value to the derivative free optimizer; and repeating ...until the derivative free optimizer determines that the objective has converged to a minimum within a convergence tolerance.

The Applicant notes with appreciation the Examiner's underlining to indicate relevant text. However, upon review of the text of Trahan, Trahan provides a minimum value of a function without using the commonly used process of taking a derivative and setting the derivative equal to zero, and solving for the variables. Instead, Trahan uses an algorithm to determine the minimum using a derivative free approach. Like Conn, Trahan fails to contemplate the problem solved by the present invention and also fails to disclose or suggest all of the elements of the claims.

Both Trahan and Conn provide function optimizers which employ constraints in the optimization. To oversimplify the present invention to make a point, the present invention

uses an optimizer to optimize a function but also to optimize the results of a simulated solution in a way not taught or suggested by the cited references.

As such, it is respectfully submitted that Trahan fails to disclose or suggest the all of the elements of claim 1. As such claim 1 and its dependent claims are believed to be in condition for allowance for at least the stated reasons. In addition, claim 6 and its dependent claims are also believed to be in condition for allowance for essentially the same reasons as set forth regarding claim 1. Claim 6 includes additional features not disclosed or suggested by Tarhan as well. Reconsideration of the rejection is earnestly solicited.

Enclosed herewith please find a "Change of Correspondence Address" form. The Examiner is requested to update the records accordingly.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

An executed Change of Correspondence Address is attached herewith. As such, Applicant kindly requests changing the Correspondence Address to the address listed below.

A Petition for a one month extension of time is enclosed in duplicate for payment processing. The U.S. Patent Office is authorized to charges applicant's representatives deposit account No 50-0510 the petition fee. It is believed that no additional fees or charges are currently due. However, in the event that any additional fees or charges are required at this time in connection with the application, they may be charged to applicant's representatives Deposit Account No. 50-0510.

Respectfully submitted,

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